

## **CLAIMS**

### **What is claimed is:**

1. An implantable cardiac stimulation device, comprising:  
a pulse generator adapted to provide stimulating pulses for application to a patient's heart;  
a detector adapted to detect activity in a ventricle and an atrium of the patient's heart; and  
a controller configured to provide at least two post-ventricular atrial blanking interval values each associated with a different type of cardiac event, wherein the at least two post-ventricular atrial blanking interval values comprise a first post-ventricular atrial blanking interval employed after ventricular pace events and a second post-ventricular atrial blanking interval employed after ventricular sense events.
2. The implantable cardiac stimulating device of claim 1, wherein at least one of the post-ventricular atrial blanking intervals is programmable.
3. The implantable cardiac stimulating device of claim 1, wherein said controller selects the programmable post-ventricular atrial blanking period interval values from among a plurality of discrete atrial blanking period interval values.
4. The implantable cardiac stimulating device of claim 1, wherein said controller is configured to execute a search routine to systematically apply a plurality of different atrial blanking period interval values and to receive an indication of whether far-field R-waves are detected by said detector after expiration of each applied atrial blanking period interval value.

5. The implantable cardiac stimulating device of claim 4, wherein said controller executes said search routine such that the different atrial blanking period interval values are employed in ascending order, and selects for use the atrial blanking period interval value, or a derivative thereof, that first results in failure to detect a far-field R-wave by said detector after expiration of the atrial blanking period interval value.

6. The implantable cardiac stimulating device of claim 4, wherein said controller executes said search routine such that the different atrial blanking period interval values are employed in descending order, and, after detection of a far-field R-wave by said detector after expiration of an applied atrial blanking period interval value, selects for use the last atrial blanking period interval value, or a derivative thereof, that resulted in failure to detect a far-field R-wave by said detector after expiration of the atrial blanking period interval value.

7. The implantable cardiac stimulating device of claim 4, wherein said controller automatically runs said search routine after implantation of said implantable cardiac stimulating device to initially select the programmable post-ventricular atrial blanking period interval values.

8. The implantable cardiac stimulating device of claim 4, wherein said controller is configured to automatically, without manual intervention, run said search routine after implantation of said implantable cardiac stimulating device and after initial selection of the programmable post-ventricular atrial blanking period interval values, to update one or more of the programmable post-ventricular atrial blanking period interval values.

9. The implantable cardiac stimulating device of claim 1, wherein said controller is configured to execute a first search routine to determine a value for said first post-ventricular atrial blanking interval and a second search routine to determine a value for said second post-ventricular atrial blanking interval.

10. The implantable cardiac stimulating device of claim 1, further comprising a non-volatile erasable memory in which the programmable post-ventricular atrial blanking period interval values are stored.

11. A method for use with an implantable cardiac stimulation device, the method comprising:  
detecting activity in an atrium and a ventricle of a patient's heart;  
after a sensed ventricular event, applying a first post-ventricular atrial blanking period;  
after a paced ventricular event, applying a second post-ventricular atrial blanking period that is different from the first post-ventricular atrial blanking period.

12. The method of claim 11, wherein selecting the value for at least one of said first post-ventricular atrial blanking period interval and said second post-ventricular atrial blanking period interval comprises selecting values for both said first post-ventricular atrial blanking period interval and said second post-ventricular atrial blanking period interval from among said plurality of available atrial blanking period interval values.

13. The method of claim 12, wherein said plurality of available blanking period interval values comprise discrete values which differ for said first post-ventricular atrial blanking period interval and said second post-ventricular atrial blanking period interval.

14. The method of claim 11, wherein selecting the value for at least one of said first post-ventricular atrial blanking period interval and said second post-ventricular atrial blanking period interval comprises executing a search routine to systematically apply the available atrial blanking period interval values and monitor whether far-field R-waves are detected after expiration of each applied atrial blanking period interval value.

15. The method of claim 14, wherein both the first post-ventricular atrial blanking period interval and the second post-ventricular atrial blanking period interval are selected using said search routine.

16. The method of claim 14, wherein said search routine applies said available atrial blanking period interval values in ascending order and selects the discrete atrial blanking period interval value that first results in failure to detect a far-field R-wave after expiration of the discrete atrial blanking period interval value.

17. The method of claim 14, wherein said search routine applies said available atrial blanking period interval values in descending order until a far-field R-wave is detected after expiration of an applied atrial blanking period interval value, and selects the last discrete atrial blanking period interval value that resulted in failure to detect a far-field R-wave after expiration of the atrial blanking period interval value.

18. The method of claim 11, wherein selection of the value for at least one of said first post-ventricular atrial blanking period interval and said second post-ventricular atrial blanking period interval is carried out in response to instructions received from a remote source.

19. A pacing system for providing electrical stimulation to a patient's heart, comprising:

an implantable cardiac stimulation device comprising:

sensing circuitry capable of detecting activity in the atrium and ventricle of a patient's heart;

a pulse generator adapted to provide stimulating pulses for application to at least the atrium of the patient's heart;

memory for durably storing a plurality of post-ventricular atrial blanking interval values, each of said post-ventricular atrial blanking interval values associated with a different type of ventricular event; and  
control means configured to modify the duration of the atrial blanking period after occurrence of a ventricular event based upon the type of ventricular event by selecting the post-ventricular atrial blanking interval value corresponding to the ventricular event type.

20. The pacing system of claim 19, wherein said plurality of post-ventricular atrial blanking interval values comprises a first post-ventricular atrial blanking interval value employed after ventricular pace events and a second post-ventricular atrial blanking interval value employed after ventricular sense events.

21. The pacing system of claim 19, wherein said programming means facilitates selection of said at least one selectable post-ventricular atrial blanking interval value from among a plurality of discrete atrial blanking period interval values.

22. The pacing system of claim 19, wherein said control means is configured to execute a search routine to systematically apply different atrial blanking period interval values and to receive an indication of whether far-field R-waves are detected by said detector after expiration of each applied atrial blanking period interval value.

23. The pacing system of claim 19, wherein said programming means comprises a remote interface whereby selection of at least one of said post-ventricular atrial blanking interval values is carried out in response to instructions received from a remote source.

24. An implantable cardiac stimulation device, comprising:  
a pulse generator adapted to provide stimulation pulses for application to a patient's heart;  
a detector adapted to detect activity in the ventricle and the atrium of the patient's heart; and  
a controller configured to provide a first post-ventricular atrial blanking interval after ventricular pace events and a second post-ventricular atrial blanking interval after ventricular sense events.

25. The implantable cardiac stimulating device of claim 24, wherein both of said first post-ventricular atrial blanking interval and said second post-ventricular atrial blanking interval are programmable.

26. The implantable cardiac stimulating device of claim 25, wherein said controller is configured to execute a first search routine to determine a value for said first post-ventricular atrial blanking interval and a second search routine to determine a value for said second post-ventricular atrial blanking interval.

27. The implantable cardiac stimulating device of claim 26, further comprising a remote interface in communication with said controller, wherein at least one of said first search routine and said second search routine are initiated in response to instructions received from a remote source.

28. The implantable cardiac stimulating device of claim 24, further comprising a remote interface in communication with said controller, for facilitating selection of at least one of said post-ventricular atrial blanking intervals.